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Introduction to The Occurrence Process Rain through *Project-Based Learning* the Early-Age Child

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Abstract

Early childhood science learning is one way to develop children's potential by applying the right learning model so that children can gain new knowledge from the results of observation, exploration, and experiments with various objects around during learning. The purpose of this study is the introduce the process of rain through Project-based Learning for early childhood. The subjects of this study were teachers and 20 children in class B1, while the object was the introduction of the process of rain. Primary Data is data obtained directly or data obtained from the first source through observation and interviews. While secondary data is data obtained indirectly in the form of photos and journals. This research method is descriptive qualitative research. Data collection techniques in this study are observation, interviews, and document studies. This observation activity is carried out through observation with children directly to obtain data for the study. Interviews were conducted with teachers and children. Documentation is carried out to obtain pictures or photos of the children studied. Data analysis techniques through data reduction are grouping, analyzing data that has been collected then presenting data is carried out by displaying the results that have been reduced, after the data is displayed then concluded. The results showed that the introduction of the process of rain through Project-based learning for early childhood can train children's cooperation, and increase activeness and creativity, children are directly involved in the experimental process so that understanding simple concepts of science in children's daily lives will be more optimal.
Keywords: Early Childhood, Project-based Learning, Occurrence of Rain

Introduction

Early childhood is the golden age for children's growth and development in terms of physical, moral, cognitive, social-emotional, language, and art. At this time all aspects of development can be easily stimulated so that the potential of children can develop optimally. The introduction of science is one way to develop children's potential. Introducing science can be done starting from around the environment that is close to the child, such as the environment where the child lives. To introduce science learning that is close to children's daily lives, it is inseparable from efforts to choose and sort out what activities are right to do with children (Astuti & Nurhafizah, 2023). Every child has a general knowledge and science spirit like children like to ask, observe, try new things, and have great curiosity (Norhikmah, 2022). Through science, children can conduct simple experiments directly to find out why the event happened. One of them introduces children to how rain events.

Rain is one of the natural events. Rain is a deposit of water that falls to the surface of the earth. Introduce rain events to children using the right method, so that children not only understand the concept but children understand how seawater evaporates due to exposure to sunlight, and then the water turns into rain. The introduction of science to children should be packaged in interesting learning, using fun methods according to the age level and level of child development and involving all five senses (Poerwati et al., 2021). The more sensory involvement in science learning, the more children understand what is learned from the results of their senses. Teachers should provide stimulation during science learning that allows children to discover simple facts and concepts on their own.

In early childhood, science learning will be more effective by applying the right learning model, so that children can gain new knowledge from the results of observation, exploration, and experiments with various objects around during learning. The Project-based Learning model is one of the effective learning models for improving children's abilities. This learning model begins with the stage of collecting information, namely in the form of ideas and questions tailored to the chosen topic, and then developed in learning, playing, and exploration activities (Nisfa et al., 2022). Activities in the Project-based Learning model are child-centered (student-centered) so that children are more active in these learning activities (Sari et al., 2023). The emphasis on learning lies in children's activities from beginning to end, so that these

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activities are meaningful and provide benefits to children. Project-based learning encourages children to be creative, and social, acquire basic knowledge, and be able to think critically.

Project-based learning model allows it to be applied to early childhood, considering the characteristics of children who have a great curiosity, like to repeat, like to try, like challenges, and like to learn many new things, including science (Norhikmah, 2022). The purpose of the experimental activity is that children can feel and think critically about what is happening, and then the child will think about the problems faced during the experimental activity. This process will require children to find solutions, the purpose of being demanded is the demands of circumstances that will construct children's thinking to think critically in solving problems (Elina et al., 2023). The Project-based Learning model will stimulate and stimulate activities that are exploratory and probing, recognize cause and effect, and draw conclusions that later children have good critical thinking skills for their future (Handayani & Sinaga, 2022).

Based on initial observations made at BA Aisyiyah Karangduren Sawit District, it was found that teachers did not vary in designing science learning. Learning is only teacher-centered with the use of Children's Worksheets (LKA) and magazines. This results in less interesting learning for children, because teachers only use media in the form of pictures. Learning media is one of the supporters of the learning process that can support the quality of learning for the better (Safira, 2020). One of the functions of learning media is as a carrier of information or messages from teachers to children, to attract children's attention so that they can foster learning motivation. In addition to learning less varied media, achievement in learning emphasizes more in reading, writing, and arithmetic (CALISTUNG). Until parents and teachers place high hopes on programs that are structured by parents and teachers, good learning can foster learning experiences that help develop child development and play an important role in making children ready to enter higher education (Katoningsih, 2022). Early childhood learning is comprehensive, not focusing on certain aspects. There needs to be creativity during learning to accommodate and develop children's critical thinking.

Early childhood science learning still tends to be teacher-oriented and monotonous. Monotonous and teacher-centered learning results in uninteresting learning (Yaswinda et al., 2023). Children only listen to explanations from teachers so children become bored quickly because teachers are less varied/creative in managing fun learning. Children are only limited to knowing concepts and memorization of science, not directly involved in science activities. In this learning, children should be taught directly how to feel, experience, and try natural phenomena so that they can stimulate curiosity, creativity, interest, solve problems, and think critically.

Project-based Learning helps children think critically, disturb curiosity about science symptoms, and ask questions; with simple sentences but can invite children to be able to think more actively, and reason; invites children to be able to think logically by the natural phenomena they experience, try; to carry out simple experiments to prove the curiosity they experienced concluded; Children can convey their findings to friends in their class (Nyihana, 2021). Therefore, it is necessary to conduct a more in-depth analysis related to science learning problems.

Method

This type of research is a qualitative description. The subjects of this study were teachers and 20 children in class B1, while the object was the introduction of rain. This research was conducted at BA Aisyiyah Karangduren for one week from 09 to 14 October 2023. In general, the data used in this study uses primary data and secondary data. Primary Data is data obtained directly or data obtained from the first source through observation and interviews. While secondary data is data obtained indirectly in the form of photos and journals. Data collection techniques in this study are observation, interviews, and document studies. This observation activity is carried out through observation with children directly to obtain data for the study. Interviews were conducted with teachers and children. Documentation is carried out to obtain pictures or photos of the children studied. Data analysis techniques through data reduction are grouping, analyzing data that has been collected then presenting data is carried out by displaying the results that have been reduced, after the data is displayed then concluded.

Result and Discussion

Based on the researchers' observations that the introduction of the process of rain has not been maximized, this can be seen when children are given simple questions about how the process of rain occurs and what the consequences are if a rain event occurs. One of the causes of the lack of maximum learning is that the media used by teachers is less varied, the learning process is more explanatory without being accompanied by pictures/videos, so children only imagine without being able to be directly involved in how the process of rain. Therefore, researchers then apply the Project-based Learning model to introduce the process of rain. The purpose of introducing the process of rain through Project-based Learning is so that children can understand the simple concepts of science in the surrounding nature and that children have an open attitude towards things they just know. This research was carried out in semester 1 of the 2023/2024 academic year which aims to introduce the process of rain through Project-based Learning for early childhood. The research findings include;

Table 1. Results of Interviews with Principals and Teachers

No	Question	Subject	Interview Results
1.	What do you think the Project-based learning model looks like?	Principal	I think the Project-based Learning model is the same as the learning model using projects. So, children make a *project* that has been planned together.
		Master A	In my opinion, the child's Project-based Learning model is the center of learning, focusing on the learning process rather than the results. So, children are given the freedom to determine a learning project.
2.	What are the steps in implementing Project-based Learning?	Principal	In applying this Project-based Learning, you can go through simple steps first, because what we value in this learning is a process, not the result. First, the teacher tries to dig up what information the child knows, then the child is given time to convey his ideas/opinions. The next stage is for children to design a *project* and compile an agreed activity schedule. After the core stage, the teacher monitors the child during the activity by facilitating each process and asking questions or statements. The final stage is to assess and evaluate activities.
		Master A	The first step is that the teacher provides questions or statements about the material to be learned, then compiles and makes a project schedule, the next stage is the teacher monitors children's activities during activities, and the last stage is to assess the results of children's activities and evaluate their experiences.
3.	Are there any obstacles in the implementation of this Project-based Learning model?	Principal	Yes, there are obstacles such as the time it takes a long time and the amount of equipment we have to provide.
		Master A	There are obstacles, for example, there are some children who even play alone or lack concentration, limited space, and lack of teacher experience in applying this Project-based Learning model
4.	How are teachers' efforts in creating a conducive atmosphere when using the Project-based Learning model?	Principal	Teachers' efforts in creating an atmosphere when using the Project-based Learning model by making children the center of the activity.
		Master A	The staff held activities in comfortable places, such as under trees, on the classroom terrace, and in the field. When our children take them out of class, they are very enthusiastic to create an atmosphere of fun activities.
5.	What attitude values can be developed in this Project-based Learning model?	Principal	Train children's cooperation, increase children's activeness, and hone children's critical thinking.
		Master A	Increase children's independence, train socially, and increase children's creativity.

Based on the table above, we can describe related to the introduction of the process of rain through Project-based Learning for early childhood. In early childhood science learning, teachers can choose the right learning model to introduce children to how the process of rain occurs. *Project-based Learning* is one of the right learning models to introduce the process of rain. Because this learning model is child-centered and focuses on the learning process, not on the results. So, children are given the freedom to determine a project that is planned together. The main purpose of this learning is to familiarize children with using knowledge and implementing it in Project-based Learning, expressing their creativity and imagination in a *project* (Sari et al., 2023). Learning using Project-based Learning Children can develop a project both individually and in groups to produce a product (Rehny, Zifhana; Permatasari, 2023).

Apply a learning model Project-based Learning for early childhood is still simple. This learning model is designed simply according to the child's level of development (Norhikmah, 2022). In the first step of this learning, the teacher tries to explore what information is known by the child by giving questions or statements. From general information to narrowing down to the part of an issue to be created project. Children are given time to express their opinions. In the second step, children are invited to arrange an activity where children can choose for themselves what activities they will plan and determine the schedule of activities that have been mutually agreed upon. In the third step, the teacher monitors the child's activities during the activity. Teachers can facilitate children's activities and provide stimulation and footing in the form of questions or statements. The last step is to assess the child's activities and provide evaluations that motivate the child so that the next activity is even better. Learning Project-based Learning gives many children free space; therefore, this learning needs to be considered carefully (Hardiyanti, 2023). However, the application of *Project-based Learning is* not easy, several obstacles must be faced by every teacher.

Obstacles faced by teachers include the time needed for a long time, the amount of equipment that must be provided, limited space, and the lack of experience of teachers in implementing this learning model. Teachers have never received in-depth training to understand *Project Based Learning* (Yusriani et al., 2020). Meanwhile, success in Project-based

Learning depends on the teacher's ability to explore children's potential to develop (Ningrum et al., 2021). Many teachers are comfortable with the traditional classroom, where the teacher plays a leading role in the classroom. With some of the obstacles above teachers can create an effective and pleasant atmosphere.

One of the teacher's efforts in creating an effective and conducive atmosphere is holding activities in comfortable places such as under trees, on the classroom terrace, and in the field. Make the child the center of attention. Remembering that teachers must create an important atmosphere that can develop the potential of children both individually and in groups (Elsa, 2022). Teachers are required to create learning activities that are fun, not monotonous, and have meaning. So that the values of attitudes that exist in Project-based Learning can be developed to the maximum by the teacher.

The value of attitudes developed in learning Project-based Learning aims to train children's cooperation and increase children's activeness. This learning model can provide new experiences, make children active in learning, and increase cooperation (Rahayu et al., 2020). In addition, in learning Project-based Learning can also motivate children to respond to good learning and improve children's critical and creative thinking so that it can be used as an alternative application of integrative learning to train student activities in collaborating, communicating, and creating a work/product (Trimawati et al., 2020). Project-based Learning Assessments will develop various basic skills that children must have including decision-making skills, thinking skills, creativity abilities, and problem-solving abilities, and at the same time seen as effective for developing children's self-confidence (Hutapea, 2017).

Based on the interview above, the results can be further strengthened by observations of children. First, children can express their opinions/ideas. Self-confidence can make a person express himself well, learn to overcome simple problems, dare to appear in public, dare to ask and answer questions in simple sentences, dare to express opinions, and strive to do a job with responsibility (Aryenis, 2018). Based on the observations made, the teacher managed to dig up any information related to natural events. In this case, the teacher provides information about God's created objects, one example of which is water, so that it can be connected to natural events. Some children enthusiastically mentioned various kinds of natural events they knew, ranging from earthquakes, landslides, fires, erupting mountains, floods, lightning to rain.

Second, children can solve a problem. Problem-solving is an activity related to choosing a solution suitable for action and changing current conditions to the expected situation (Anggraini, Wika ; Nasirun, 2020). In this case, the child is given information about the cause and effect of natural events, and how the child can overcome the problem. Based on the observations made, the teacher gave an example of the process of rain, and what the consequences are when it rains heavily throughout the day. Various answers they said, including; Fallen trees, many puddles, leaky houses, can't go anywhere, lights out, and floods. The teacher tried to ask again about the cause of the flood and how to overcome it. The children were so eager to answer questions from the teacher, that they talked about the experiences they had, although in general, the flood they experienced was not high. Problem-solving skills are a provision for children to adults, children can overcome difficulties or new things they face when doing activities in the home, school, and community environments (Lestari, 2020).

Figure 1. Rain Process Experiment

Third, children can observe and conduct experiments on the process of rain. Based on the observations made, when the teacher explains and practices how the process of rain occurs using simple tools, children are very enthusiastic about listening and listening to what the teacher does and children try to practice it. This process begins when water on the surface of the earth undergoes an evaporation process, which is the process of evaporating water due to sunlight (Khamidinal, 2021). In practice, the evaporation process is facilitated with boiling water placed in a clear container. Next is the condensation process, which is a condensation process in which water vapor that has risen into the atmosphere will condense and turn into ice particles that form clumps hanging in the air (Afkarina, 2023). In practice, the condensation process is illustrated by a container containing ice cubes placed on top of the boiling water container. The last process of precipitation is the melting of clouds containing water droplets due to the influence of high air temperatures (Afkarina, 2023). When the water droplets already have a large size, the granules will fall to the surface of the earth which is commonly called rain (Rahmatunnisa et al., 2022). In practice, the precipitation process is illustrated by granules dripping into the container. The child observes the fall of water droplets from the container for 1-2 minutes, the longer it is observed, the

more often the water drips. From this, we know that children are allowed to be directly involved in learning through observation and practice it in everyday life.

Fourth, children can explain the process of rain and express feelings, experiences, and results after conducting experiments. Storytelling activities provide unique and interesting learning experiences, can thrill feelings, raise enthusiasm, and cause preoccupation, so storytelling activities allow the development of early childhood emotional dimensions (Agustin, 2020). Based on the observations made, some children scrambled to tell how the process of rain occurred in a reasonable attitude, not stiff and calm. They told from the beginning of the evaporation process to precipitation in a simple language style accompanied by laughter.

Conclusion

The results showed that the introduction of the process of rain occurrence through Project-based Learning For early childhood can train children's cooperation, increase children's activeness and creativity, and hone children's critical thinking. By conducting experiments, children are directly involved in learning so that understanding simple concepts of science in children's daily lives will be more optimal. Through Project-based Learning The child can express his feelings, experiences, and results with enthusiasm after conducting experiments.

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